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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,067	07/11/2003	Jifa Hao	90065.000701/17732.6357.0	4314

44331 7590 06/05/2007
HISCOCK & BARCLAY, LLP
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EXAMINER

ROSE, KIESHA L

ART UNIT	PAPER NUMBER
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2822

MAIL DATE	DELIVERY MODE
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06/05/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/618,067	HAO ET AL.	
	Examiner	Art Unit	
	Kiesha L. Rose	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14, 20, 21 and 23-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14, 20, 21 and 23-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the RCE filed 6 April 2007.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 14,20,21 and 23-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Hshieh (U.S. Patent 6,051,468).

In re claim 14, Hshieh discloses a power semiconductor device (Fig. 6) that comprises a semiconductor substrate (44), a source layer (58) at one surface of the substrate and comprising a high concentration of a dopant of one polarity (N), a region (62) lightly doped with the one polarity (N), a single drain (64) on the other surface of the substrate, a well layer (60) beneath the source layer doped with a dopant of opposite polarity (P), a plurality of trenches (48) penetrating the source line and terminating in said region lightly doped with said one polarity, trenches substantially filled with a conductive material (52), a highly conductive layer (118) on the surface of the source layer comprising a material reacted from a metal and the substrate, an insulating layer (66) on the highly conductive layer and on the conductive material in the trenches, vias formed in the insulating layer and extending to the highly conductive layer

Art Unit: 2822

on the source line and conductive material (68) filling the vias for contacting the highly conductive layer.

In re claim 20, the trenches are filled with polysilicon (Col. 5, lines 14-17) and the top surface of the polysilicon is covered with a highly conductive material (120) reacted from a metal and the substrate.

In re claim 21, the highly conductive layer is a silicide. (Col. 10, lines 1-3)

In re claim 23, the silicide is reacted from titanium. (Col. 10, lines 1-3)

In re claim 24, the insulating material is BPSG or PSG. (Col. 7, lines 24-26)

In re claim 25, the trenches are lined with a trench wall insulating material (54) and the insulating material on the highly conductive layer contacts the ends of the trench wall insulating layer lining the walls of the trench. (Fig. 6)

In re claim 26, the vias terminated on the surface of the highly conductive layer for making electrical connection between the highly conductive source layer and the conductive material filling the vias. (Fig. 6)

Response to Arguments

Applicant's arguments with respect to claims 14, 21 and 23-24 have been considered but are moot in view of the new ground(s) of rejection.

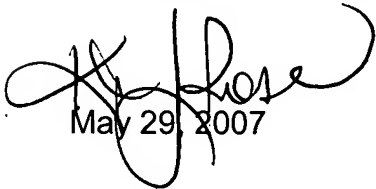
Conclusion

Art Unit: 2822

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiesha L. Rose whose telephone number is 571-272-1844.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



May 29, 2007